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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/295,022	04/20/99	ATHENS N	050506-1010

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SCOTT A HORSTEMEYER
THOMAS KAYDEN HORSTEMEYER & RISLEY LLP
100 GALLERIA PARKWAY NW
SUITE 1500
ATLANTA GA 30339

EXAMINER	
KRECK, J	
ART UNIT	**PAPER NUMBER**
3673	5

DATE MAILED: 11/09/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/295,022	ATHENS ET AL.	
	Examiner	Art Unit	
	John Kreck	3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 April 1999* is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of the CERTIFIED copies of the priority documents have been:

1.☐ received.

2.☐ received in Application No. (Series Code / Serial Number) _____ .

3.☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

14) ☒ Notice of References Cited (PTO-892)
15) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
16) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
17) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
18) ☐ Notice of Informal Patent Application (PTO-152)
19) ☐ Other: .

DETAILED ACTION

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 3673.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 50. Correction is required.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the separator (claims 5 and 33); supply valve (claim 8); the ends of the injection well, the well casing and drop tube being in the vadose zone or at the groundwater level (claims 14, 15, 17, 18, 20, 21, 36, 37, 39, 40, 42, and 43) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Specification

The disclosure is objected to because of the following informalities: on page 13, line 23, it appears as if "well 26" should be changed to "well 23".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 8-10, 27, 29-32, 33, 35, 49 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 5 and 33, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 8 is unclear regarding the supply valve and the well casing. As far as the invention can be understood; the well casing is associated with the drop tube, not the injection well (see claim 1). Therefore, the supply valve would not be in communication with the well casing.

Claims 9 and 10 recite the limitation "said lateral wall of said injection well". There is insufficient antecedent basis for this limitation in the claims. It is noted that the lateral wall is associated with the well casing (claim 1) or the drop tube.

Claim 27 recites the limitation "said product" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 29 is unclear regarding the limitation "facilitating a reaction..." Is this the same reaction as set forth in claim 28? Claims 30-32 are also unclear because they depend from this claim.

Claims 31 and 32 are also unclear regarding the introduction of catalyst and product. Regarding claim 32, is the product injection started and then stopped before the catalyst injection is started? Is the product injection started and continued while the catalyst is injected? Similarly, for claim 31; is the catalyst fully injected first?

Claim 35 is indefinite regarding the limitation "said step of supplying fluid being variable". It is unclear as to in what manner the step can be varied.

Claims 49 and 50 are unclear regarding the steps of producing vacuum and allowing the product to react. It is unclear as to whether the product should be allowed to react completely before producing vacuum (claim 49) and whether the step of producing vacuum is completed before allowing the product to react (claim 50). Also, it is difficult to understand how the product can be "allowed" to react (or prevented from reacting) once it is injected. It is suggested that the step of injecting be substituted for the step of producing vacuum in these claims (although it would still be unclear as to whether these steps should be completed fully before the next step is undertaken.)

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 102 and 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 27 is rejected under 35 U.S.C. 102(b) as being anticipated by Land, et al. '974. Land shows a decontamination system having a product supply means (16); means for introducing the product into a subsurface zone (20); vacuum means (see col. 10, lines 6-11); and extraction means (22).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 28, 29, 33, and 35-51 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Land, et al. '974. Land shows a method including the steps of introducing a product (claim 1 of Land, step a);

allowing the product to react (step b); disposing a well (step c); producing a vacuum (step d); and extracting the end product (step e). The Land reference does not explicitly describe the well casing or the drop tube. It is apparent from the figures (See figure 2, the drop tube is shown near 18 and the casing is shown near 22) that Land used a drop tube and a well casing (Land used drawing conventions to show a drop tube and a well casing that are well known in the art); alternatively, it would have been obvious to one skilled in the art at the time of the invention to have used a casing and a drop tube (as called for in claim 28). Both well casings and drop tubes are common features of modern well construction; used for example, to prevent the well from collapsing, and to control the point from which fluids are extracted. For the catalyst (called for in claim 29), see col. 2, lines 34-39 and col. 4, line 60 through col. 5, line 2. Note that in col. 6, lines 57-58; the product may be injected continuously or in batches, thus being "variable" (as called for in claim 35). For the locations of product introduction and the drop tube with regards to the zones (claims 36-44), see the abstract. For the details of extracted products (liquid/vapor and phase separation, claims 45-47), see col. 7, lines 7-23 and lines 37-41. See also claim 1 of Land (steps b and d) and claim 4 of Land for the order of injecting and applying vacuum (claims 48-50), also see col. 12, lines 31-47 where the vacuum is applied before the injection is started.

Claims 1-5, 7, 8, 12, 14-23, 26 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Land, et al.

'974. The Land reference shows an injection well (16, 20) and explicitly shows all of the other limitations of these claims (as detailed above); with the exception of the vacuum pump, fluid pump, the supply valve, and the drop tube open at the distal end. The Land reference does not explicitly disclose how the vacuum is generated; however a vacuum pump is the only efficient way of generating a vacuum. It is apparent that Land used a vacuum pump to generate the vacuum; alternatively, it would have been obvious to one skilled in the art at the time of the invention to have used a vacuum pump to generate a vacuum because vacuum pumps are efficient devices for creating a vacuum. Also, Land does not explicitly disclose a fluid pump and a supply valve, however the Land reference does disclose that the injection can be done continuously, or in pulses. It is apparent that Land used a pump and a supply valve in order to pulse the injection; alternatively, it would have been obvious to one skilled in the art at the time of the invention to have used a pump and a supply valve in order to control the injection. With regards to the drop tube open at the distal end, it is apparent that the tube of the Land reference would be open at the distal end in order to extract the reaction end products. Alternatively, it would have been obvious to one skilled in the art at the time of the invention to have provided the drop tube with an opening at the end in order to extract reaction end products through the tube. (Note that the limitations of claims 2-4 regarding the sequence of combining the product and catalyst are not given any weight as apparatus.)

Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974. Land shows all of the limitations of these claims (as detailed above) with the exception of the order of combining/injection of the catalyst and product. It is well known in the art of chemistry that catalysts can be added at any stage of a chemical reaction; that the catalyst can be added before the reactants are mixed; while the reactants are being mixed, or after the reactants are mixed. It would have been obvious to one skilled in the art at the time of the invention to have combined the product and catalyst before, during, or after the injection; or to have injected the catalyst before, simultaneously with, or after the injection of the product. The order of combining and injection would have been an obvious matter of choice; based on the well known principle that a catalyst can be added at any point in a chemical reaction.

Claims 6, 13 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. in view of Hess, et al. '676. The Land reference shows all of the limitations of these claims (as detailed above) with the exception of the filter and the drop tube having an opening in the lateral wall. The Land reference does teach the desirability of treatment with activated carbon (col. 7, lines 19-22); but the reference does not disclose how this should be carried out. The Hess reference shows a similar soil contaminant treatment system that incorporated a carbon filter to treat the extracted products. It would have been obvious to one skilled in the art at the time of the invention to have added a filter to the system of Land, et al. to treat the extracted products. The carbon filter of Hess contains the activated carbon desired by Land, and would have

provided it in a convenient form. Regarding the drop tube, it is notoriously conventional in the art of wells to provide tubes with openings, as evidenced by Hess, et al. It would have been obvious to one skilled in the art at the time of the invention to have provided an opening in the wall of the drop tube in the invention of Land, et al.; or, alternatively, to have provided a drop tube with an opening as taught by Hess, et al. in the system of Land, et al., the opening in the wall of the drop tube would have allowed the extraction of reaction end products from any desired location in the well.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al '974 in view of Nelson, et al. '700; or Dela '250; or Devlin '550. The Land reference shows all of the limitations of these claims (as detailed above) with the exception of the screen or perforations in the injection well. It is notoriously conventional in the well art to provide perforations or screens to prevent clogging of the well or to provide for injection or extraction over a range of depth. Also, Nelson, et al. '700; Dela '250; and Devlin '550 show the use of screens or perforations in injection wells. It would have been obvious to one skilled in the art at the time of the invention to have provided perforations or a screen in the injection well of the Land reference to provide for injection or extraction over a range of depth and to prevent clogging.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974 in view of Braithwaite, et al. '888. The Land reference shows all of the limitations of claim 11, with the exception of the closed end of the well casing. The Braithwaite reference shows a similar injection/extraction well system in which the well

casings are provided with closed ends to assist in driving the casings into the ground. It would have been obvious to one skilled in the art at the time of the invention to have closed the end of the well casing of the Land invention to assist in driving the casings into the ground.

Claims 24, 25, 52, and 53 rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. in view of Vigneri '141. The Land reference shows all of the limitations of these claims with the exceptions of the surfactant and co-solvent. Vigneri teaches the use of surfactant in a similar system (see col. 64-65). It would have been obvious to one skilled in the art at the time of the invention to have used a surfactant in the invention of Land, et al. in the manner of Vigneri in order to improve the properties of the product. It would have been further obvious to one skilled in the art to have added a co-solvent; it is well known in the art that co-solvents can be used to enhance the properties of surfactants. (Note also that Vigneri shows the use of valves and pumps and the pre-injection of catalyst as known in the art).

Prior Art and Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Croy '757 shows an extraction well having a closed end with a drop tube and pump. Beard, et al. '605 shows a similar system with perforated injection and extraction wells. Brown, et al. '443 shows the use of surfactant in a similar system.

Savery '883; Bernhardt '330; Meo '067; Williams, et al. '505; Kawabata, et al. '664; and Cooper, et al. '230 show similar systems.

It is noted that the applicant asserts that the Land, et al. reference does not disclose the simultaneous extraction of liquid and vapor by vacuum extraction. This would be an incorrect interpretation of the Land, et al. reference; as evidenced by col. 7, lines 29-31 and 36-40; and col. 13, lines 7-9.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on 6:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen Lillis can be reached on (703)308-3248. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3597 and (703)305-7687.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.

Eileen Dunn Lillis
Primary Examiner

JJK
November 5, 1999